# Climate Change and Energy Use

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Pictured above: Solar Panels at North of Chile.

# **Climate Change and Energy Use**

Global imperatives to reduce emissions, adapt to the effects of climate change and transition to a low-carbon economy continue to intensify. 2019 saw numerous climate-related extreme weather events around the world and over six million people participating in climate demonstrations across 150 countries.<sup>17,18</sup> In response, governments and companies are committing to unprecedented action.

### Industry context

To achieve the objectives of UN Sustainable Development Goal 13 on climate action and the Paris Agreement, which commits governments to limiting global temperature rise to well below 2°C, a number of major mining jurisdictions, including Canada and Chile, have made climate change commitments and are reporting on their progress towards implementing them.<sup>19</sup>

### Teck context

At Teck, we recognize that climate change is a key global risk, that it is directly influenced by human activity and that it requires decisive global action. Failure to act will expose the world to climate change impacts that will be costly for global ecosystems and for society as a whole. We are a signatory to the Paris Pledge for Action and believe we have a responsibility to help address this global challenge by reducing emissions at our operations, advocating for effective climate policies and responsibly producing the metals, minerals and energy that are essential for building the technologies and infrastructure needed to transition to a low-carbon economy.

The copper, lead, zinc and steelmaking coal produced at our operations are among the lowest carbon intensity products in the world compared to our peers.

Building on this track record, we set new goals in climate change, with a new strategic priority to be a carbon neutral operator by 2050.

Our responsibility to address climate change also includes accounting for climate-related risks and opportunities in our business strategies and at our operations. In August 2019, we released our second Portfolio Resilience in the Face of Climate Change report, aligned with the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD), which outlines the potential implications of three climate-related scenarios for our business looking forward to 2040. These range from a scenario that limits climate change to 2° Celsius (C) above pre-industrial levels to scenarios with more significant climate change in that time frame.

#### **GRI Indicators and Topic Boundary**

302-103, 302-1, 302-3, 302-4, 305-103, 305-1, 305-2, 305-3, 305-4, 305-5

This topic is considered one of the most material by our shareholders, local communities, regulators and society in relation to Teck's sites, power providers, service providers and customers.

### How Does Teck Manage This Topic?

Information about how we manage greenhouse gas emissions and energy use, including relevant policies, management practices and systems, is available for download on our website.

### 2019 Highlights

249 terajoule reduction in energy use

297 thousand tonne reduction in greenhouse gas (GHG) emissions since 2011 **Introduced first two electric passenger buses** for crew transportation at our steelmaking coal operations.

Released the 2019 Portfolio Resilience in the Face of Climate Change report, aligned with the Task Force on Climaterelated Financial Disclosure (TCFD) recommendations.

# **Our Performance in Climate Change and Energy Use in 2019**

**Our Targets and Commitments** We take action to reduce GHG emissions by improving our energy efficiency and implementing low-carbon technologies. The following table summarizes our performance against our 2020 sustainability goals related to climate change and energy use and introduces our new strategic priority and goals.

2020 Sustainability Strategy Goals	Status	Summary of Progress in 2019
Implement projects that reduce energy consumption by 2,500 terajoules (TJ). <sup>(1)</sup>	On track	Achieved 2,469 TJ reduction to date (i.e., 2011-2019).
Implement projects that reduce GHG emissions by 275 kilotonnes (kt) of CO <sub>2</sub> -equivalent (CO <sub>2</sub> e). <sup>(1)</sup>	Achieved	Achieved goal in 2017. Total reductions to date of 297 kt of CO <sub>2</sub> e.
Assess opportunities and identify potential project partners toward achieving our 2030 alternative energy goal.	On track	Purchased the SunMine Solar Energy Facility from the City of Kimberley. Procured more solar power for Quebrada Blanca Phase 2.
Engage with governments to advocate for effective and efficient carbon pricing.	On track	Advanced advocacy efforts on carbon pricing through engagements with the British Columbia, Alberta and Canadian governments, through efforts such as the B.C. Climate Solutions and Clean Growth Advisory Council, which is co-chaired by Teck Senior Vice President, Sustainability and External Affairs, Marcia Smith.

(1) Energy and GHG reductions are measured against a 2010 base year which was selected to align with a 10 year reduction period in relation to the 2020 goals

### **New Strategic Priority and Goals**

Strategic Priority	Goals	
• Be a carbon neutral operator by 2050	1. Reduce the carbon intensity of our operations by 33% by 2030.	
	2. Procure 50% of our electricity demands in Chile from clean energy by 2025 and 100% by 2030.	
	3. Accelerate the adoption of zero-emissions alternatives for transportation by displacing the equivalent of 1,000 internal combustion engine (ICE) vehicles by 2025.	
	Details about the context, definitions and key performanc indicators related to this strategic priority and these goals are available on our website at www.teck.com/responsibility	

Teck has set an ambitious objective of achieving carbon neutrality across all its operations and activities by 2050. Teck starts from a strong position to work towards carbon neutrality, building on our track record of taking action to reduce our carbon footprint and improve energy use at our operations.

Teck's progress on reducing carbon emissions and supporting climate action to date include:

- 82% of all electricity use sourced from renewable, zero-carbon power sources
- 297,000-tonne reduction in greenhouse gas (GHG) emissions at our operations since 2011
- Among the world's lowest carbon intensities for our steelmaking coal, copper, and refined zinc and lead production
- Signatory to the Paris Pledge for Action and member of the Carbon Pricing Leadership Coalition, actively advocating for a global price on carbon
- Released our second Portfolio Resilience in the Face of Climate Change report, aligned with the TCFD, outlining our approach to scenario planning
- Founding member of Canada's Oil Sands Innovation Alliance (COSIA); to date, COSIA members have spent over \$200 million to evaluate and develop GHG reduction technologies
- Collaborating with the International Council of Mining and Metals (ICMM) to reduce GHG emissions from large mobile mining equipment
- Carbon price costed into the majority of business
  paid over \$500 million CDN in carbon taxes in Canada since 2008

#### Initial Road Map to Carbon Neutrality

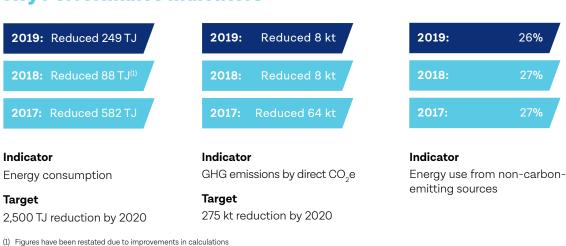
Teck will deploy a range of measures, technologies and approaches to achieve our goal of being carbon neutral by 2050. At a high level, this will include looking at alternative ways of moving materials at our mines, using cleaner power sources, and implementing efficiency improvements.

We have set out an initial roadmap to achieve carbon neutrality by first avoiding emissions and then eliminating or minimizing emissions. Based on this approach, we have prioritized our most significant emissions sources and most mature technologies, among other factors.

The most significant sources of emissions across our business today and in the future are from power supply and mobile equipment such as haul trucks. To decarbonize these emission sources and ultimately achieve our goal of carbon neutrality, we will advance the following options:

- Increase procurement of electricity for operations from clean energy sources such as solar
- Replace internal combustion engine vehicles through the adoption of zero-emissions alternatives
- Use low-carbon alternatives for moving material at sites, such as replacing diesel haul trucks with electric or low-carbon trucks, or using electricity-powered conveyors
- Use lower emission alternatives for stationary combustion processes (e.g. steelmaking coal dryers)
- Assess the potential for using emerging technologies such as carbon capture and storage
- Work with industry partners (ICMM, COSIA, etc.) to
  advance carbon reduction technologies for mining

We are actively evaluating solutions that are commercially competitive today and monitoring earlier stage technologies as they mature towards commercial viability.



## **Key Performance Indicators**

Figures have been restated due to improvements in calculations

# **Reducing Our Carbon Footprint<sup>20</sup>**

Throughout our business units, operations and project planning stages, we assess a full spectrum of environmental risks, including those associated with energy use and GHG emissions. As shown in Figure 9, Scope 1 (direct) GHG emissions are those that occur from energy sources that are owned or controlled by the company. Scope 2 (indirect) GHG emissions are those that occur from the generation of purchased electricity consumed by the company and physically occur at the facility where electricity is generated.

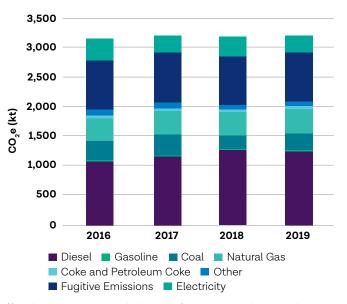
In 2019, our total GHG emissions (Scope 1 and Scope 2), as CO<sub>2</sub>e, were 3,226 kilotonnes (kt), compared to 3,210 kt in 2018. Of those totals, our direct (Scope 1) GHG emissions were 2,936 kt in 2019, compared to 2,869 kt in 2018. We estimate our indirect (Scope 2) GHG emissions associated with electricity use for 2019 to be 290 kt, or approximately 9% of our total emissions. These emissions are associated primarily with our Cardinal River, Carmen de Andacollo and Quebrada Blanca operations, as their electricity power grids are based heavily on fossil fuels. Elsewhere, our indirect emissions were relatively small, as operations in B.C. obtain a significant proportion of their electricity from hydroelectric generation.

Scope 3 emissions are other emissions that arise from sources owned or controlled by other entities within our value chain, such as those arising from the use of our products, business travel by employees and the transportation of materials that we purchase and sell. In 2019, our most material Scope 3 emissions were 73,000 kt, which are from the use of our steelmaking coal product by our customers.

In this report, we have also introduced two updates to our GHG quantification methodologies that have resulted in restatements to our historical figures. The first update was

made to the emission factor used to estimate fugitive methane at our coal operations. This update was made to reflect changes within our regulatory reporting obligations. The second update was made to the electricity emission factors used in British Columbia to more accurately reflect historical annual estimates of the electricity grid's GHG intensity.





 For electricity emissions in Canada, the emission factors use 2010 as a base year and are based on the most recent version of the Canadian National Inventory Report.
 Fugitive emissions from our coal operations (i.e., estimated methane release) are captured as direct emissions. For fugitive emissions, the emission factors use 2010 as a base year and are based on the most recent version of the Canadian National Inventory Report.

#### Table 19: Total Emissions (kilotonnes CO<sub>2</sub>e)<sup>(1)</sup>

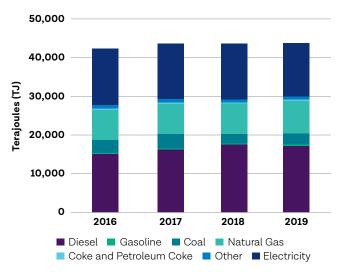
	2019	2018	2017	2016
Total Emissions — Direct (Scope 1)	2,936	2,869	2,954	2,817
Total Emissions – Indirect (Scope 2)	290	341	284	372
Total Emissions (Scope 1 + Scope 2)	3,226	3,210	3,238	3,189
Total Emissions — Scope 3 (Use of coal product sold)	73,000	76,000	78,438	79,053

(1) Teck's quantification methodology for our Scope 1 and Scope 2 emissions is aligned with The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard

# **Positioning Teck to Thrive in the Low-Carbon Economy**

#### **Energy Use and Reduction**

In 2019, we consumed a total of 44,032 TJ of energy (i.e., electricity and fuels), as compared to 43,866 TJ in 2018, as shown in Figure 10. In 2019, six of our operations (Cardinal River, Coal Mountain, Greenhills, Carmen de Andacollo, Quebrada Blanca and Pend Oreille) reduced their absolute energy consumption from 2018. Collectively, projects implemented in 2019 have reduced annual energy consumption at our operations by 249 TJ - enough to power 2,311 homes for a year. Since 2011, our efforts have resulted in reduction projects totalling 2,469 TJ of savings.



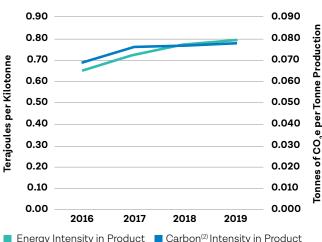
#### Figure 10: Energy Consumption by Type<sup>(1)</sup>

(1) Other includes propane, waste oil, fuel oils and other process fuels

In 2019, approximately 26% of our energy requirements (i.e., electricity and fuels) were supplied by non-carbon-emitting sources, primarily hydroelectricity, compared to 27% in 2018. Of our total electricity consumption in 2019, 82%, or 11,491 TJ, was from renewable energy sources, the majority of which is hydroelectricity.

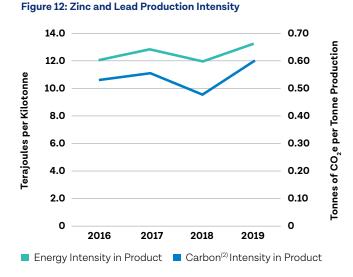
In Figures 11 to 13, we outline our energy intensity, or the amount of energy used per tonne of product, as well as the carbon intensity. According to data from the ICMM, at 80 kilograms of CO<sub>2</sub>-equivalent per tonne of steelmaking coal produced, the emissions intensity of our steelmaking coal is approximately half the industry average of more than 150 kilograms. Similarly, our copper production averages 2.56 tonnes of CO<sub>2</sub>-equivalent per tonne of copper produced, which is 36% below the industry average of 4 tonnes. Our goal is to continue to improve the carbon intensity of our operations and future projects.



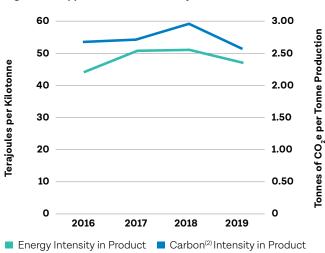


Energy Intensity in Product Carbon<sup>(2)</sup> Intensity in Product

Energy and carbon intensity for the production of steelmaking coal increased in 2019 (Figure 11). This change is primarily a result of mining in new, recently permitted areas at a number of our operations, with increased strip ratios to generate production after the closure of Coal Mountain. Increased strip ratios require more waste material to be moved for an equivalent amount of coal production, therefore increasing the energy and carbon intensity of the product.



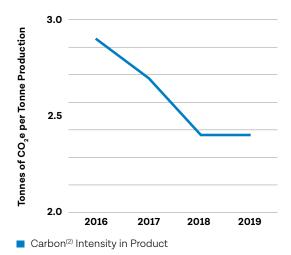
Energy and carbon intensity for the production of zinc and lead increased in 2019 (Figure 12). This change is primarily due to lower throughput and zinc grades. Trail Operations also experienced a decline in refined zinc production due to the electrical equipment failure.



#### **Figure 13: Copper Production Intensity**

Energy and carbon intensity for the production of copper decreased in 2019 (Figure 13). This change is attributed to a larger proportion of the total copper production coming from Highland Valley Copper, which is a low-carbon and energyintensive operation, in relation to Carmen de Andacollo and Quebrada Blanca operations. In 2019, Highland Valley Copper experienced higher ore grades and improved recovery.

#### Figure 14: Teck Carbon Intensity on a Copper Equivalent<sup>(1)</sup> Production Basis



(1) Only the primary commodities we report on - i.e. coal, copper and zinc - are included within the equivalency calculation. Lead has been excluded. Carbon equivalency was calculated by using a three-year commodity price average, using prices reported in our previous annual reports.

(2) Carbon intensity includes Scope 1 and Scope 2 emissions and is stated on a CO<sub>2</sub>e basis, which is inclusive of CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, PFCs, SF<sub>6</sub> and NF<sub>3</sub> as appropriate.

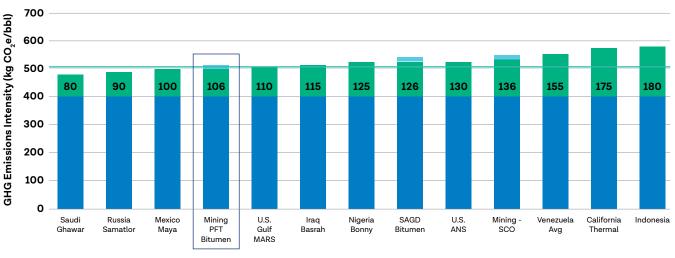
Figure 14 is new to our sustainability disclosures. It is demonstrating Teck's carbon intensity, which includes total Scope 1 and 2 emissions as reported above against a tonne of copper equivalent. We have used this metric – intensity per tonne of copper equivalent – in order to provide a single carbon intensity metric for the organization as a whole.

### Case Study: Using Solar Power at our Quebrada Blanca Phase 2 Project

At Teck's Chilean operations, where the majority of energy is currently supplied by conventional sources like coal and natural gas, increasing our use of renewable energy brings opportunities to greatly reduce greenhouse gas (GHG) emissions, while creating potential for long-term savings on energy costs. Recognizing these opportunities, in 2020, we set ambitious goals for our Chilean operations to procure 50% of our electricity from clean energy by 2025 and 100% by 2030. To work towards these goals, Teck's QB2 project renegotiated part of its power agreement with AES Gener in early 2020 to increase the project's use of renewable energy to 118 megawatts (MW) starting as early as 2022. Once effective, more than 50% of QB2's total operating power needs will be from renewable sources, including wind, solar and hydroelectric energy. This agreement secures reliable, long-term power for our major copper growth project at no additional cost, while helping to reduce our environmental footprint. Read the full case study at www.teck.com/news/stories/.

#### **Investing in our Energy Business Unit**

As the International Energy Agency (IEA) has articulated in looking at all future energy use scenarios, oil and gas will continue to be an important part of the world's energy mix for the foreseeable future, even in the transition to a low-carbon economy. Teck holds a minority interest (21.3%) interest in Suncor's Fort Hills oil sands mine. Located approximately 90 kilometres north of Fort McMurray in the Athabasca oil sands region of northeastern Alberta, Fort Hills is an open-pit truck and shovel mine. It incorporates industry-leading technologies to achieve best-in-class environmental performance. As a result, at 37.5 kilograms of  $CO_2$ -equivalent per barrel of oil (bbl), the carbon intensity of oil produced from Fort Hills is the lowest in the oil sands by a significant factor (Figure 15). We believe that lower-carbon production such as from Fort Hills can help to displace more carbon-intensive barrels as the world transitions to cleaner energy sources.



#### Figure 15: GHG Emissions Intensity of Oil Sands Facilities<sup>(1)</sup>

Fort Hills – Lower carbon intensity than 50% of the US refined barrels of oil

Total Life Cycle Emissions Intensity (kg CO,e/bbl refined product – gasoline/diesel)

Estimated Improvements Since 2012 Production & Refining End-User Fuel Consumption U.S. Refined Average

(1) Source: Bloomberg, BMO Capital Markets

# **Carbon Pricing and Advocating for Climate Action**

We believe that broad-based pricing of carbon is one of the most effective ways to incentivize real reductions in GHG emissions by ensuring that all emitters contribute to the solution. In 2019, we continued to advocate for carbon pricing policies that maintain the global competitiveness of tradeexposed industries to prevent carbon leakage, which is when GHG emissions move from one jurisdiction to another as a result of differences in carbon prices. Currently, all of our steelmaking coal operations are covered by carbon pricing, as is half of our copper business, the Fort Hills oil sands mine and all of our metals refining business.

We continue to see a trend among governments to pursue climate change policies. Some of the most significant action has taken place in Canada, where the majority of our operations are located and Canada has some of the highest carbon prices in the world.<sup>21</sup> In 2019, the federal government implemented the *Greenhouse Gas Pollution Pricing Act*, which prices carbon in Canadian provinces not already covered by their own carbon price. The Province of British Columbia also increased the B.C. carbon tax by \$5 per tonne of  $CO_2e$  from \$35 to \$40 in 2019. This price is expected to increase by \$5 per tonne of  $CO_2e$  in 2021.

As part of its commitment to address impacts on emissionsintensive, trade-exposed industries, the B.C. Government continued to develop its Clean Growth Program for Industry, which includes an industrial incentive to reduce carbon tax costs for operations meeting ambitious emissions standards, as well as an industry fund to invest carbon tax revenue directly into emission reduction projects. In Alberta, a new industryspecific carbon price policy, called the Technology Innovation and Emissions Reductions (TIER), is expected to be implemented in 2020. Details are still emerging, and we will continue to engage with regulators and assess the potential implications of these policies on our operations and projects.

In 2019, we continued to work with the Mining Association of British Columbia (MABC) and the Business Council of British Columbia (BCBC) on carbon pricing policy, to provide both policy direction and technical input to the government, with a view to maintaining the competitiveness of industry in the province.

We are also engaging with the B.C. Government directly through the provincial Clean Growth Advisory Council, for which Marcia Smith, Teck's Senior Vice President, Sustainability and External Affairs, was the co-chair in 2018 and 2019. Teck has more than a decade of experience with carbon pricing policies, which has informed our work to help advance the effective design and acceptance of carbon pricing policies globally. This is best demonstrated by our participation in the Carbon Pricing Leadership Coalition.

Timely and transparent climate and environmental disclosures are important to Teck and its communities of interest and are a key component of driving sustainability. Building on over a decade of public reporting on climate change, in 2019, we continued to participate in the Carbon Disclosure Project (CDP). We also engaged with the Climate Action 100+, a leading investor initiative that supports action on climate change, on topics such as our emission reduction and alternative energy targets.

# Summary of Portfolio Resilience in the Face of Climate Change

In August 2019, we released our Portfolio Resilience in the Face of Climate Change report. The report looks at how Teck is positioned for a low-carbon economy by analyzing potential business risks and opportunities under three different climate change scenarios:

- 1. 3.5°C: A Story of Inaction
- 2. 2.7°C: A Story of Transition
- 3. Below 2°C Scenario: A Story of Transformation

These scenarios provide information on how Teck is analyzing and preparing for the risks and opportunities that may emerge as the global community combats climate change and moves to a lower-carbon future. This report builds on our 2018 Climate Action and Portfolio Resilience report and aligns with recommendations from the Task Force on Climate-related Financial Disclosure, which we support.

### Case Study: Electric Buses at our Elk Valley Mines Reduce Energy Use and Emissions

Teck's vehicle fleet, which runs primarily on diesel, generates a significant portion of our total GHG emissions. Low-emission vehicles present a major opportunity to reduce our carbon footprint and take advantage of cost savings and other benefits. As part of our commitment to reducing our emissions and leveraging innovation and technology, Teck introduced two eLion C Series electric buses for crew transport in 2019, in a 12-month pilot project. The 40-passenger eLion buses replace diesel crew transport buses at our Fording River and Greenhills operations in the Elk Valley. Read the full case study at teck.com/news/stories/.

# **Adapting to Physical Climate Risks**

We are taking steps to guard against the future impacts of climate change, as we recognize that ongoing changes to climate can increase the physical climate risks to our mining operations and to related infrastructure. Several of our operations have experienced weather events that are potentially climate related, including warming conditions at Red Dog Operations and increased snowmelt runoff leading to flooding at Highland Valley Copper (HVC) Operations. In 2019, we implemented climate adaptation measures at several of our operations. At HVC, we continued to execute our spring runoff water management strategy to protect key infrastructure and we completed climate change analyses to contribute to long-term adaptation plans for the mine. At our Fording River Operations, we continue to advance a flood mitigation project, in response to erosion caused by high water levels in 2013. At our operations in Chile, we advanced projects to reduce our fresh water consumption in response to potential water availability constraints due to future climate conditions.

### Case Study: Adapting Our Flood Management to Respond to Changing Climate Variability

In 2017, an unusually long winter at our Highland Valley Copper (HVC) Operations, combined with sharp temperature increases in the late spring, resulted in heavy snowmelt flows. To manage this larger than normal volume of water, mining was temporarily paused as the site worked to rebalance water across the site. Following this event, HVC implemented a number of new flood management systems, including installing additional pumping capacity and real-time flow monitoring stations. These measures have been effective - while spring runoff levels were similarly high in 2018 compared to 2017, the new systems helped to minimize the impacts of snowmelt runoff in 2018 as well as in 2019. Read the full case study at https://www.teck. com/news/stories/.

## **Outlook for Climate Change and Energy Use**

In 2020, Teck will continue to incorporate planning for climate-related risks and opportunities into our business strategies and at our operations. We will also continue to track and refine indicators that influence the strength and resilience of our assets in a low-carbon world, such as the electric vehicle market, growth in renewables and global carbon prices. As in previous years, we will advance the four pillars of our Strategy for Climate Action — reducing our carbon footprint, positioning Teck for the low-carbon economy, advocating for climate action and adapting to the physical impacts — and work to achieve our 2020 goals for Energy and Climate Change.

Moving forward, we will work towards our strategic priority of being a carbon neutral operator by 2050. We have set new goals in climate change, which include reducing the carbon intensity of our operations by 33% by 2030, procuring 50% of our electricity demands in Chile from clean energy by 2025 and 100% by 2030 and accelerating the adoption of zero-emissions alternatives for transportation by displacing the equivalent of 1,000 internal combustion engine (ICE) vehicles by 2025. Our focus in 2020 will be on concluding the final steps of our 2020 goals within our previous sustainability strategy, and on making progress towards achieving our new goals.